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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/628,941 | 07/29/2003 | Roger A. Fratti | 12-19 | 9094 |

7590 01/30/2004

Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06824

EXAMINER

MAGEE, THOMAS J

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2811

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/628,941 | Applicant(s) FRATTI ET AL. | |
| | Examiner Thomas J. Magee | Art Unit 2811 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections – 35 U.S.C. 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 6, 8, and 13 - 16 are rejected as being unpatentable over Hebert (US 6,091,110) in view of Wilson et al. ("Handbook of Multilevel Metallization for Integrated Circuits, Noyes Publ., Westwood, New Jersey, (1993) pp. 223 – 225) and Zommer (US 6,162,665).

3. Regarding Claims 1 – 6, and 8, Hebert discloses a method for controlling the curvature (and stress) (Col.1, lines 54 – 59) of a DMOS device (Col. 2, lines 35 – 39), wherein a thin film (24) (Figure 1C), comprising a CVD silicon oxide (Col. 2, line 54), is formed on a substrate as an encapsulant and stress compensation layer. Hebert does not disclose that the deposited oxide film has a tensile stress. However, Wilson et al. disclose (p.225, 1st para.) that the film exhibits a tensile stress, where the thickness can be adjusted (p.223, eq. 13) to achieve a counterbalancing of the overall residual stress. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Wilson et al. with Hebert to obtain a tensile film that could be altered to counterbalance residual stress within the device.

Further, Hebert does not disclose thinning of the substrate. Zommer discloses (Col. 2, lines 8 – 12) that the breakdown voltage is altered by changing the thickness of the substrate to alter resistivity by aggressive backsurface grinding, polishing, or thinning (Col.2, lines 40 – 43), Such techniques introduce damage that will alter the residual stress, but achieve lowered resistivity in the substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the procedures of Zommer in Hebert to obtain a backsurface thinned substrate with altered resistivity and breakdown voltage.

4. Regarding Claims 13 – 16, Hebert discloses a power transistor device (Col. 2, lines 35 – 39), wherein a thin film (24) (Figure 1C), comprising a CVD silicon oxide (Col. 2, line 54), is formed on a substrate as an encapsulant and stress compensation layer. Hebert does not disclose that the deposited oxide film has a tensile stress. However, Wilson et al. disclose (p.225, 1st para.) that the film exhibits a tensile stress, where the thickness can be adjusted (p.223, eq. 13) to achieve a counterbalancing of the overall residual stress. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Wilson et al. with Hebert to obtain a tensile film that can be altered to counterbalance residual stress within the device.

Further, Hebert does not disclose thinning. Zommer discloses (Col. 2, lines 8 – 12) that the breakdown voltage is altered by changing the thickness of the substrate to alter resistivity by aggressive backsurface grinding, polishing, or thinning (Col.2, lines 40 – 43), Such techniques introduce damage that will alter the residual stress, but achieve lowered resistivity in the substrate. It would have been obvious to one of ordinary skill in the art at the time of the

invention to use the procedures of Zommer in Hebert to obtain a backsurface thinned substrate with altered resistivity and breakdown voltage.

Finally, although Hebert does not explicitly disclose that the device is part of an integrated circuit, it is inherent that the fabrication procedures and intended utilization are part of an integrated circuit manufacturing methodology, wherein the power transistor is incorporated with other elements to produce a working system.

5. Claims 7, and 9 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebert in view of Wilson et al. and Zommer, as applied to Claims 1 – 6, and 8, and further in view of Finot et al. (US 5,847,283).

6. Regarding Claims 7, and 9 – 12, Hebert does not disclose the device curvature measurements or the techniques utilized. Wilson et al. disclose (p. 223 –224) that an optical laser system can be utilized to measure curvature. Finot et al. in similar fashion disclose (Col. 6, lines 34 – 41) that a laser reflective procedure can be used to determine curvature. Using the laser optical system, appropriate curvatures before and after film deposition can be monitored to alter or maintain the curvature and Stoney's equation (Wilson et al., p.223, eq. 13) used to determine stress. It would have been obvious to one of ordinary skill in the art to combine Finot et al. and Wilson et al. with Hebert to obtain a procedure for determining and measuring the radius of curvature of the device.

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Conclusions

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to **Thomas Magee**, whose telephone number is **(703) 305 5396**. The Examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM (EST). If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, **Eddie Lee**, can be reached on **(703) 308-1690**. The fax number for the organization where this application or proceeding is assigned is **(703) 872-9306**.



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Thomas Magee
January 7, 2004